



Burnout prevalence and associated risk factors among KFU students, Alhasa, Saudi Arabia

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ABSTRACT

Introduction: Burnout has mental health outcomes and physical health outcomes including multiple aches and pains, digestive upset and cardiovascular risks. Burnout affects work satisfaction, job performance, disease susceptibility and interpersonal interactions. It is important to have a better explanation and understanding of the factors associated with burnout. Besides, there is little known about burnout among college students in Saudi Arabia. There are no studies that focus on the difference between burnout in students in different colleges at the same university in Alhasa city. **Objectives:** To determine the prevalence of burnout levels among students at King Faisal University in Alhasa city. Also, to have better clarification and understanding of the risk factors associated with burnout. **Methods:** This is a cross-sectional study that will be conducted at King Faisal University in Alhasa city. Data will be collected from the students using questionnaires filled out by survey. **Results:** The study included 439 students whose ages ranged from 18 to 32 years. Burnout was detected in total among 30.5% of the students while it was moderate among 50.8%, and the remaining percentages had a low level of burnout. High burnout was detected among those who live alone, with a low GPA, and the highest burnout was reported among intern and 1st-grade students. Additionally, high burnout was observed among previously failed students and those who had a low-income level with a highly significant difference. While, there is no association between age, gender, and marital status of our participants and burnout prevalence. Burnout scores among learners were correlated with personal achievement and depersonalization. **Conclusion:** Almost one-third of the students had a high burnout score, half of them had a moderate score of burnout, burnout distribution among university students was associated with most personal data.

Keywords: Burnout, Risk factors, KFU Students, Saudi Arabia

1. INTRODUCTION

Burnout is defined according to the International Classification of Diseases 11th revision (ICD-11). Burnout is a condition conceptualized as a consequence of persistent stress in the workplace that has not been handled effectively. Three dimensions describe it: feelings of loss or exhaustion of energy; increased mental distance from one's work, or feelings of job-related negativism or cynicism; and Decreased professional effectiveness. In the occupational sense, burnout applies exclusively to phenomena and can not be used to characterize conditions in other areas of life (Shanafelt et al., 2016).

A meta-analysis was done in 2019 showed that the prevalence of burnout among nurses globally is 11.23% (Woo et al., 2020). A Brazilian study published in 2018 and an Indian study published in 2020 found that the burnout prevalence was 44.9% and 48.5% among undergraduate medical students, respectively (Boni et al., 2018; Vidhukumar & Hamza, 2020). A cross-sectional study was done in Riyadh, Saudi Arabia, concluded that 13.4% of medical students at Alfaisal University had burnout (Altannir et al., 2019). A systematic review of burnout risk factors among European healthcare professionals found that studies focus mainly on three categories as risk factors leading to the development of burnout. These three categories are socio-demographic factors, including country, age, gender, hospital type, etc. The second category is the psychosocial factors, including personality variables, stress, and coping mechanism. The last one is the occupational and organizational factors such as organizational justice, effort-reward imbalance, social support at work, etc. The systemic review concluded that the occupational factors are strong predictors of burnout syndrome among different specialties included in review (Bria et al., 2012).

A study done in Saudi Arabia among medical students found a direct correlation between students' Grade Point Average (GPA) and burnout. Other factors were that increase the prevalence of burnout among the students are failing in a course and not participating in extracurricular activities (Shadid et al., 2020). Several studies have shown that medical students are more burdened than the general population by stress-related disorders and the start of medical school, indicating better overall mental health than non-medical students of the general population. These findings imply that the educational process itself may lead to increased psychological distress (Erschens et al., 2018).

Burnout has mental and physical health outcomes, including multiple aches and pains, digestive upset, and cardiovascular risks. Burnout impacts job satisfaction, job performance, vulnerability to illnesses, and interpersonal relationships (Chemali et al., 2019). Although there are many studies about the prevalence of burnout globally, it is crucial to better explain and understand the factors associated with burnout. Besides, there is little known about burnout among college students in Saudi Arabia. To the best of our knowledge, there are no studies that focus on the difference between burnout on students in different colleges at the same university in Alhasa city.

2. METHODS

Study design

A cross-sectional study was conducted to explore the burnout prevalence and associated risk factors among KFU students, Alhasa, Saudi Arabia because a community-based sampling survey is not feasible due to the current circumstances of social distancing, the tool that we used to conduct the study was an online Google form questionnaire distributed through the use of different types of social media apps including what's up, Twitter and Telegram.

Study population

The study will include students at King Faisal University in Alhasa city, Saudi Arabia

The Inclusion Criteria

(a) Saudi male and female attending KFU (b) Undergraduate students at KFU

The Exclusion Criteria

(a) Students who have a psychiatric history (b) Non-Saudi students (c) Postgraduate learners (master, etc).

Survey Tool, Instrument, Dissemination, and Validation

The survey questionnaire was designed in Arabic, as it is the native language in Saudi Arabia. The survey consists of items that were developed and published during the period between July 2020 and September 2020 with 439 responses. Some of those items have been conducted and validated by the WHO Regional Office for Europe. A small adjustment to the survey was made to encourage clearer interpretation and coordinate the questions before the final survey was sent to the targeted population through a Google link. The survey took a time of 4 minutes to complete.

Sample

The sample size that Google form showed was 439 responses with a margin of error of 5% and 95% confidence Interval. A minimum of 300 responses was required for the study (Open Epi, 2020).

Validation of the Study

For validation purposes, the questionnaire was first proposed to three experts in the field of research to check if the questions in the questionnaire adequately measure the burnout and the associated risk factors. After that, the questionnaire was pretested by distributing the questionnaire to 13 participants who were excluded from the study later. The internal accuracy of these data from these questionnaires was tested using Cronbach's alpha. Sufficient internal consistency (Cronbach's alpha = 0.82) was found.

Ethics approval and consent to participate

This study was approved by the Ethics Committee of King Fahad Medical City. Before filling the survey, and according to the Helsinki declaration, there was a statement that declares that Participant's secrecy and privacy were guaranteed. Submission of a complete answered survey was considered as an agreement to share in the study. The study was approved by the Medical Ethics Committee of King Fahad Medical City. Ethical approval code is 20-446E

3. RESULTS

The study included 439 students whose ages ranged from 18 to 32 years with a mean age of 21.6 ± 6.8 years old. The majority of the students were females (72.7%; 319). Exact of 330 (75.2%) nurses were single, and 107 (24.4%) were married. Most students live with their families (91.6%; 402) and 323 (73.6%) had an average income level. The most-reported GPA was 4.1-5 (54.4%; 239), and only 149 (33.9%) students previously failed in a study subject. Regarding additional activities, 67.7% of the students reported negative answers (no additional activities outside class), and 19.4% joined students' clubs, while 10.7% practiced sports activities. As for the effect of online learning perceived by the students, 56.7% of the students reported that online learning badly affected study quality, 54.7% reported a bad impact on student's psychological health, while only 26.9% reported it did not affect (Table 1).

Table 1 Personal data of sampled University students, Saudi Arabia

Personal data		No	%
Age	18-22	259	59.0%
	23-27	177	40.3%
	28-32	3	.7%
Gender	Male	120	27.3%
	Female	319	72.7%
Marital status	Single	330	75.2%
	Married	107	24.4%
	Divorced/ widow	2	.5%
Living with	Alone	32	7.3%
	With family	402	91.6%
	With college	5	1.1%
Income level	Low	99	22.6%
	Average	323	73.6%
	High	17	3.9%
Academic year	1 st	32	7.3%
	2 nd	68	15.5%
	3 rd	88	20.0%
	4 th	80	18.2%
	5 th	65	14.8%
	6 th	41	9.3%
	Intern	65	14.8%
GPA	2.1-3	38	8.7%

	3.1-4	162	36.9%
	4.1-5	239	54.4%
Previously failed in a study subject	Yes	149	33.9%
	No	290	66.1%
Additional activities outside class	None	297	67.7%
	Students club	85	19.4%
	Sport activities	47	10.7%
	Arcan	10	2.3%
	Part time work	28	6.4%
	Community services	6	1.4%
	Others	17	3.9%
Areas of bad effect of online learning	None	118	26.9%
	Study	249	56.7%
	Psychological	240	54.7%
	Economically useless	10	2.3%
	Physical tiredness	7	1.6%

Table 2a and 2b illustrates burnout among university students, Saudi Arabia. Exact of 97% of the students reported that Dealing with colleagues/medical students all day long requires a great deal of effort, 90.1% feel emotionally drained by my studies/tasks at the College of Medicine, and 79.6% feel they must study too hard at their college. Regarding depersonalization, 96.4% of the students reported feeling tired when getting up in the morning having to face another day at KFU, College of Medicine. 87.2% stated that at the end of the day, they are at the end of their patience, 51.2% reported not caring about what happens to some of their colleagues/medical students. Considering personal achievement, 96.8% of the students accomplish many worthwhile things while attending the College of Medicine and 93.6% looked after their colleague's problems very effectively. 91.6% stated feeling refreshed when being close to colleagues, and 90.7% found it easy to create a relaxed atmosphere with their colleagues. In total, 17.3% of the students had high scores in the burnout domain, 47.2% had a high score at depersonalization, and 62.2% had a high score for personal achievement. Burnout was detected in total among 30.5% of the students, while it was moderate among 50.8% (figure 1).

Table 2a Burnout among university students, Saudi Arabia

Burnout domains	Never		A few times per year		Once a month		A few times per month		Once a week		A few times per week		Every day	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
I feel emotionally drained by my studies/tasks at the College of Medicine.	39	8.9%	54	12.3%	45	10.3%	84	19.1%	31	7.1%	80	18.2%	106	24.1%
Dealing with colleagues/medical students all day long requires a great deal of effort.	13	3.0%	17	3.9%	37	8.4%	44	10.0%	43	9.8%	110	25.1%	175	39.9%
I feel like studying hard is breaking me down.	158	36.0%	49	11.2%	46	10.5%	59	13.4%	39	8.9%	42	9.6%	46	10.5%
I feel frustrated by	108	24.6%	72	16.4%	47	10.7%	70	15.9%	42	9.6%	56	12.8%	44	10.0%

Depersonalization	my studies/tasks.														
	I feel I study too hard at my college.	85	19.4%	73	16.6%	56	12.8%	82	18.7%	49	11.2%	47	10.7%	47	10.7%
	It stresses me too much to be involved in direct contact with colleagues/medical students.	192	43.7%	85	19.4%	43	9.8%	23	5.2%	36	8.2%	28	6.4%	32	7.3%
	I am at the edge of breaking down due to the responsibilities I have.	201	45.8%	52	11.8%	33	7.5%	36	8.2%	32	7.3%	27	6.2%	58	13.2%
	I feel I look at my colleagues as an object, as a person with no personality or feelings.	359	81.8%	47	10.7%	18	4.1%	9	2.1%	2	.5%	4	.9%	0	0.0%
	I feel tired when I get up in the morning and must face another day at Alfaisal University, College of Medicine.	16	3.6%	63	14.4%	58	13.2%	128	29.2%	53	12.1%	71	16.2%	50	11.4%
	I have the impression that my colleagues/medical students make me responsible for some of their problems.	257	58.5%	84	19.1%	45	10.3%	27	6.2%	9	2.1%	8	1.8%	9	2.1%
	I am at the end of my patience at the end of my university day.	52	11.8%	62	14.1%	59	13.4%	109	24.8%	41	9.3%	69	15.7%	47	10.7%
	I really don't care about what happens to some of my colleagues/medical students.	223	50.8%	78	17.8%	45	10.3%	31	7.1%	14	3.2%	20	4.6%	28	6.4%
	I have become more insensitive to people since I've been attending Alfaisal University, College of Medicine.	210	47.8%	67	15.3%	48	10.9%	50	11.4%	19	4.3%	19	4.3%	26	5.9%
	I'm afraid that this studying load is making me uncaring.	206	46.9%	43	9.8%	50	11.4%	52	11.8%	20	4.6%	22	5.0%	46	10.5%



Table 2b Burnout among university students, Saudi Arabia

Personal Achievement	Never		A few times per year		Once a month		A few times per month		Once a week		A few times per week		Every day	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
I accomplish many worthwhile things during the day while attending Alfaisal University, College of Medicine.	14	3.2%	38	8.7%	66	15.0%	118	26.9%	48	10.9%	93	21.2%	62	14.1%
I feel full of energy.	45	10.3%	40	9.1%	47	10.7%	110	25.1%	71	16.2%	111	25.3%	15	3.4%
I am easily able to understand what my colleagues/medical students feel.	43	9.8%	31	7.1%	32	7.3%	61	13.9%	67	15.3%	110	25.1%	95	21.6%
I look after my colleagues/medical students' problems very effectively.	28	6.4%	48	10.9%	59	13.4%	97	22.1%	43	9.8%	77	17.5%	87	19.8%
In my medical pathway, I handle emotional problems very calmly.	48	10.9%	43	9.8%	51	11.6%	67	15.3%	64	14.6%	82	18.7%	84	19.1%
Through my surrounding college environment, I feel that I have a positive influence on people.	44	10.0%	41	9.3%	59	13.4%	73	16.6%	40	9.1%	96	21.9%	86	19.6%
I am easily able to create a relaxed atmosphere with my colleagues/medical students.	41	9.3%	38	8.7%	28	6.4%	70	15.9%	53	12.1%	92	21.0%	117	26.7%
I feel refreshed when I have been close to my colleagues/medical students at the university.	37	8.4%	26	5.9%	17	3.9%	47	10.7%	29	6.6%	103	23.5%	180	41.0%

Table 3 demonstrates the distribution of overall burnout among university students according to their personal characteristics. Exact OD 40.6% of students who live alone had high burnout compared to none of those who live with colleges ($P=.089$). Also, 50.5% of students with a low-income level had high burnout compared to 11.8% of those with high income ($P=.001$). The highest burnout score was reported among intern and first-grade students (49.2% and 46.9%) compared to 19.1% of 2nd-grade students ($P=.011$). High burnout was detected among 42.1% of students with low GPA compared to 24.3% of those with a high GPA ($P=.012$). Exact of 38.3% of students who previously failed had high burnout compared to 26.6% of those who did not ($P=.001$).

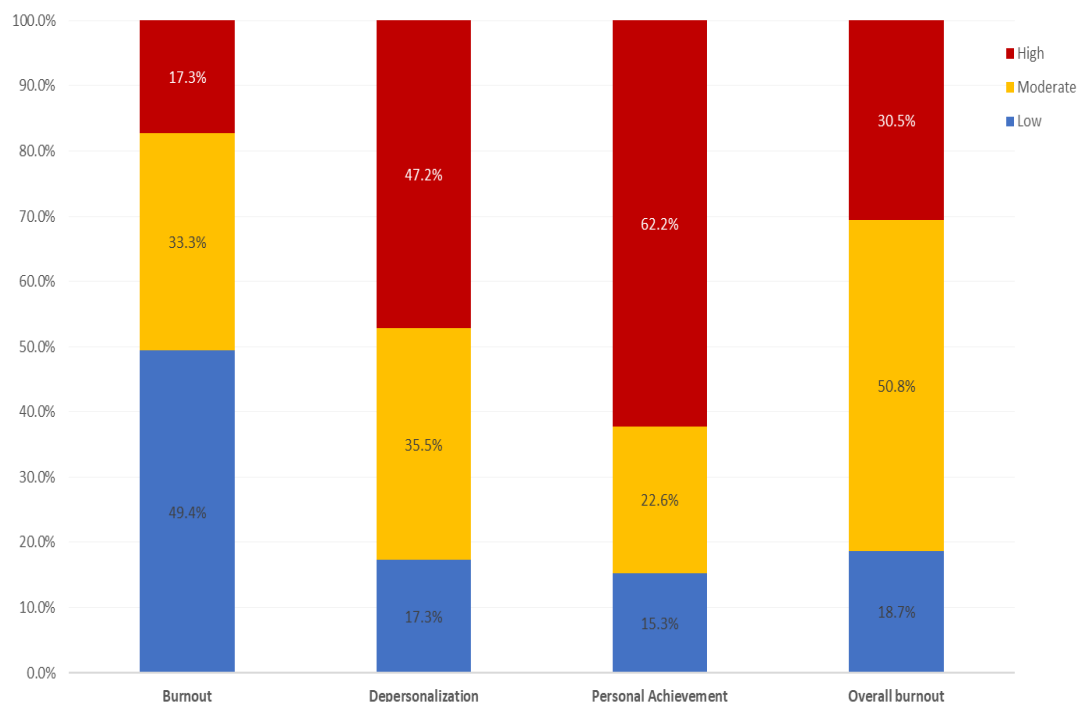


Figure 1 Burnout among university students, Saudi Arabia

Table 3 Distribution of overall burnout among university students according to their personal characteristics

Personal data		Overall burnout						P- value
		Low		Moderate		High		
		No	%	No	%	No	%	
Age	18-22	51	19.7%	134	51.7%	74	28.6%	.768
	23-27	30	16.9%	88	49.7%	59	33.3%	
	28-32	1	33.3%	1	33.3%	1	33.3%	
Gender	Male	25	20.8%	53	44.2%	42	35.0%	.232
	Female	57	17.9%	170	53.3%	92	28.8%	
Marital status	Single	61	18.5%	168	50.9%	101	30.6%	.952
	Married	21	19.6%	54	50.5%	32	29.9%	
	Divorced/ widow	0	0.0%	1	50.0%	1	50.0%	
Living with	Alone	4	12.5%	15	46.9%	13	40.6%	.089
	With family	75	18.7%	206	51.2%	121	30.1%	
	With college	3	60.0%	2	40.0%	0	0.0%	
Income level	Low	18	18.2%	31	31.3%	50	50.5%	.001*
	Average	59	18.3%	182	56.3%	82	25.4%	
	High	5	29.4%	10	58.8%	2	11.8%	
Academic year	1	5	15.6%	12	37.5%	15	46.9%	.011*
	2	13	19.1%	42	61.8%	13	19.1%	
	3	18	20.5%	46	52.3%	24	27.3%	
	4	19	23.8%	40	50.0%	21	26.3%	
	5	16	24.6%	31	47.7%	18	27.7%	
	6	5	12.2%	25	61.0%	11	26.8%	
	Intern	6	9.2%	27	41.5%	32	49.2%	

GPA	2.1-3	5	13.2%	17	44.7%	16	42.1%	.012*
	3.1-4	22	13.6%	80	49.4%	60	37.0%	
	4.1-5	55	23.0%	126	52.7%	58	24.3%	
Previously failed in a study subject	Yes	13	8.7%	79	53.0%	57	38.3%	.001*
	No	69	23.8%	144	49.7%	77	26.6%	
Additional activities outside class	None	56	18.9%	155	52.2%	86	29.0%	.193
	Students club	14	16.5%	42	49.4%	29	34.1%	
	Sport activities	12	25.5%	21	44.7%	14	29.8%	
	Arcan	3	30.0%	3	30.0%	4	40.0%	
	Part time work	6	21.4%	9	32.1%	13	46.4%	
	Community services	1	16.7%	2	33.3%	3	50.0%	
	Others	1	5.9%	14	82.4%	2	11.8%	
Areas of bad effect of online learning	None	20	16.9%	59	50.0%	39	33.1%	.363
	Study	49	19.7%	125	50.2%	75	30.1%	
	Psychological	48	20.0%	112	46.7%	80	33.3%	
	Economically useless	4	40.0%	3	30.0%	3	30.0%	
	Physical tiredness	3	42.9%	2	28.6%	2	28.6%	

P: Exact probability test

** P < 0.05 (significant)*

Data analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two-tailed tests. A p value of less than 0.05 was statistically significance. Burnout was assessed by summing-up all discrete scores for each domain (burnout, depersonalization, and personal achievement), then patients burnout scores were categorized as a reference to Burnout Self-Test Maslach Burnout Inventory (MBI). Descriptive analysis based on frequency and percent distribution was done for all variables including nurse's demographic data, GPA, personal extra class activities, and burnout items. Cross tabulation was used to assess the distribution of students' burnout levels according to their personal data and GPA. Relations significance was tested using the Pearson chi-square test.

4. DISCUSSION

Burnout is a syndrome resulting from chronic workplace stress, which adversely affects physical and mental health outcomes. In addition, burnout is identified by the sense of cynicism associated with one's work and exhaustion; it increased mental distance from one job, so it decreased professional efficacy. The present study was therefore intended to establish the prevalence of burnout levels among King Faisal University students in Alhasa city, compare each college to another, and better clarify and understand the risk factors associated with burnout. The present study showed that most participants were females (72.7%), single (75.2%), with a mean age of 21.6 ± 6.8 years old. The majority live with their family (91.6%), have average income (73.6%), and more than half (54.4%) recorded GPA from 4.1 to 5. These results are in line with (Shadid et al., 2020), who reported 96.3% of the medical students in his study, were single and 93.8% live with their parents/relatives. Also, (Almalki et al., 2017) reported a similar GPA (4.5 to 5). Much of our participants (67.7%) didn't have any additional activities; 19.4% joined the students club, while 10.7% practiced sports activities. These results agreed with (Shadid et al., 2020), who found that almost 50.8% didn't participate in any additional activities, 18.5% joined student activity club, 10.4% practiced sports and 15.7% participated in other activities. In contrast, (Fares et al., 2015) reported that 76% of preclinical medical students had extracurricular activities. More than half of our participants reported a negative impact of online learning on the quality of their study (56.7%) and their psychological health (54.7%).

The current research found that 30.5% of the university students had a high burnout score 50.8% with a moderate level and 18.7% with a low level of burnout. This might be attributed to most students exerted great efforts to deal with colleagues/medical students all day long, feel emotionally drained due to the College of Medicine's tasks (91%) and studying hard (79.6%). Our study results agreed with Haile et al., (2019), who reported that 34% of medical students at Debre Berhan University had symptoms of burnout that were significantly related to their low satisfaction toward the education system, practice lecturers, and received less

social support. Another previous study reported that burnout was detected among 30.6% of the medical students in Pakistan (Muzafar et al., 2015) and 36.7% in Ethiopia (Biksegn et al., 2016). While other previous studies reported high prevalence of burnout among medical students. A study conducted in Saudi Arabia (Shadid et al., 2020) reported that burnout was detected among 57.7% of the medical students and related this to students' expression of high cynicism, high exhaustion scores, and high-stress level (51.7%). Other literature reported a higher level of burnout than our results (Shams et al., 2013; Mohd et al., 2003). Other previous studies (Woo et al., 2020; Abdulla et al., 2011; Galán et al., 2011) reported a lower burnout level than our study; 11.23%, 12.6%, and 14.8%, respectively. This difference between burnout levels might be attributed to the difference in socioeconomic features, culture, and the study population (Haile et al., 2019).

Our results showed that the overall burnout distribution among university students was associated with most personal data. High burnout level was detected among those who live alone ($P=0.089$), with a low GPA ($P=0.012$), and the highest burnout was reported among intern and 1st grade (First year) students ($P=.011$). Additionally, high burnout was observed among previously failed students and those who had a low-income level with a highly significant difference ($P=0.001$). There is no association between age, gender, and marital status of our participants and burnout prevalence. These results agreed with Merlani et al., (2011), who reported that age, gender, and have no children are independent factors for burnout distribution. Pavlakis et al., (2010) reported that low salary and perception of stressful salary are positively associated with high burnout levels. Other studies also indicated that first-year students had higher stress and burnout compared to students of another grade (Stewart et al., 1997; Guthrie et al., 1998). This might be due to low adaptation to the new living environment, curricular content, teacher's attitude, and possible career change (Sohail, 2013). Shadid et al., (2020), reported a higher score of burnout among students with low GPA and explained that GPA plays an essential role in their future career, so a failure in courses added more stress and burnout. Humphris et al., (2002) indicated that students who live with their families had a low burnout level, which agreed with our results. On the other hand, Fares et al., (2015) reported that students who live with their families reported a lower academic level than those living alone. Additionally, 47.2% of our students expressed a high score of depersonalizations, and 62.2% had high scores for personal achievement associated with burnout prevalence among students. Hojat et al., (2015) found that higher personal accomplishment among medical students was associated with higher optimism levels. Also, Ghorpade et al., (2007) reported that personal accomplishments are positively associated with students' emotional stability.

5. CONCLUSION

The study results showed that almost one-third of the students had a high burnout score, half of them had a moderate score of burnout, and the remaining percentages had a low level of burnout. Burnout level was higher among those who live alone, with a low GPA, and the highest levels of burnout were among intern and 1st-grade students. Additionally, high burnout was observed among previously failed students and low-income levels with a highly significant difference. There is no association between age, gender, and marital status of our participants and burnout prevalence. Burnout scores among learners were correlated with personal achievement and depersonalization.

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Author's contribution

Ali Alsaad: Conception, design, data interpretation and review, Abdulhameed B. Alkhalaf: Data collecting, design, writing, and review, Khadijah M. Alali: Data collecting, statically analysis, writing and review, Jumanah H. alibrahim: Data collecting, writing, Intesar S. Almahdi: Data collecting, writing, literature review.

Competing interests

Authors declare, No conflict of interest.

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Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. Abdulla L, Al-Qahtani D, Al-Kuwari M. Prevalence and determinants of burnout syndrome among primary healthcare physicians in Qatar. *South Afr Fam Pract* 2011; 53(4):380-383.
2. Almalki S, Almojali A, Alothman A, Masuadi E, Alaqeel M. Burnout and its association with extracurricular activities among medical students in Saudi Arabia. *Int J of Med Edu* 2017; 8:144-150.
3. Altannir Y, Alnajjar W, Ahmad S, Altannir M, Yousuf F, Obeidat A. Assessment of burnout in medical undergraduate students in Riyadh, Saudi Arabia. *BMC Med Edu*. 2019; 19(1).
4. Biksegn A, Kenfe T, Matiws S, Eshetu G. Burnout Status at Work among Health Care Professionals in a Tertiary Hospital. *Ethiop J of Health Sci*. 2016; 26(2):101.
5. Boni R, Paiva C, de Oliveira M, Lucchetti G, Fregnani J, Paiva B. Burnout among medical students during the first years of undergraduate school: Prevalence and associated factors. *PLOS ONE*. 2018; 13(3):e0191746.
6. Bria M, Băaban A, Dumitrașcu DL. Systematic Review of Burnout Risk Factors among European Healthcare Professionals. *Cognitie, Creier, Comportament/Cognition, Brain, Behavior* 2012; 16(3):423-52.
7. Chemali Z, Ezzeddine FL, Gelaye B, Dossett ML, Salameh J, Bizri M, . Burnout among healthcare providers in the complex environment of the Middle East: a systematic review. *BMC public health*. 2019;19(1):1337
8. Erschens R, Keifenheim K, Herrmann-Werner A, Loda T, Schwille-Kiuntke J, Bugaj T . Professional burnout among medical students: Systematic literature review and meta-analysis. *Med Teach*. 2018; 41(2):172-183.
9. Fares J, Saadeddin Z, Al Tabosh H, Aridi H, El Mouhayyar C, Koleilat M. Extracurricular activities associated with stress and burnout in preclinical medical students. *Jour of Epidemiol and Global Health*. 2015; 6(3):177.
10. Galán F, Sanmartín A, Polo J, Giner L. Burnout risk in medical students in Spain using the Maslach Burnout Inventory-Student Survey. *Inter Archives of Occup and Environ Health*. 2011; 84(4):453-459.
11. Ghorpade J, Lackritz J, Singh G. Burnout and personality evidence from academia. *J Career Assess* 2007; 15:240-56.
12. Guthrie E, Black D, Bagalkote H, Shaw C, Campbell M, Creed F. Psychological stress and burnout in medical students: a five-year prospective longitudinal study. *Jour of the Royal Society of Med*. 1998; 91(5):237-243.
13. Haile Y, Senkute A, Alemu B, Bedane D, Kebede K. Prevalence and associated factors of burnout among Debre Berhan University medical students: a cross-sectional study. *BMC Med Edu*. 2019; 19(1).
14. Hojat M, Vergare M, Isenberg G, Cohen M, Spandorfer J. Underlying construct of empathy, optimism, and burnout in medical students. *Inter Jour of Med Edu*. 2015; 6:12-16.
15. Humphris G, Blinkhorn A, Freeman R, Gorter R, Hoad-Reddick G, Murtomaa H et al. Psychological stress in undergraduate dental students: baseline results from seven European dental schools. *Europ Jour of Dental Edu*. 2002; 6(1):22-29.
16. Merlani P, Verdon M, Businger A, Domenighetti G, Pargger H, Ricou B. Burnout in ICU Caregivers. *Am Jour of Respiratory and Critic Care Medicine*. 2011; 184(10):1140-1146.
17. MOHD SIDIK S, RAMPAL L, KANESON N. Prevalence of emotional disorders among medical students in a Malaysian university. *Asia Pacific Family Medicine*. 2003; 2(4):213-217.
18. Muzafar Y, Khan H, Ashraf H, Hussain W, Sajid H, Tahir M . Burnout and its Associated Factors in Medical Students of Lahore, Pakistan. *Cureus*. 2015.
19. OpenEpi -- Sample Size Calculation for Cross-Sectional, Cohort, and Clinical Trials. [Web1.sph.emory.edu](http://web1.sph.emory.edu). 2020.
20. Pavlakis A, Raftopoulos V, Theodorou M. Burnout syndrome in Cypriot physiotherapists: a national survey. *BMC Health Services Research*. 2010; 10(1).
21. Shadid A, Shadid A, Shadid A, Almutairi F, Almotairi K, Aldarwish T . Stress, Burnout, and Associated Risk Factors in Medical Students. *Cureus*. 2020.
22. Shams T, El-Masry R, Ghreiz S, Helal R, Audeh A. Perceived stress and burnout among medical students during the clinical period of their education. *Ibnosina Jour of Med and Biomed Sci*. 2013; 5(4):179.
23. Shanafelt T, Mungo M, Schmitgen J, Storz K, Reeves D, Hayes S. Longitudinal Study Evaluating the Association Between Physician Burnout and Changes in Professional Work Effort. *Mayo Clinic Proceedings*. 2016; 91(4):422-431.
24. Sohail N. Stress and academic performance among medical students. *Journal of the College of Physicians and Surgeons-Pakistan: JCPSP*. 2013;23(1):67-71
25. Stewart S, Betson C, Lam T, Marshall I, Lee P, Wong C. Predicting stress in first year medical students: a longitudinal study. *Medical Education*. 1997; 31(3):163-168.
26. Vidhukumar K, Hamza M. Prevalence and Correlates of Burnout among Undergraduate Medical Students - A Cross-sectional Survey. *Ind Jour of Psycholog Med*. 2020; 42(2):122-127.
27. Woo T, Ho R, Tang A, Tam W. Global prevalence of burnout symptoms among nurses: A systematic review and meta-analysis. *Jour of Psychiatric Res*. 2020; 123:9-20.

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